ADDITIONS AND CORRECTIONS TO THE POACEAE OF PUERTO RICO

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ABSTRACT

This paper reports on the occurrence of nine species of grasses (Poaceae) not previously reported for Puerto Rico (Britton & Wilson 1924, Liogier & Martorell 1982): *Aristida suringari Henrard, Brachiaria arrecta* (Dur. & Schinz) Stent, *Imperata brasiliensis* Trin., *Microstegium vimineum* (Trin.) A. Camus, *Panicum venezuelae* Hack., *Paspalum macrophyllum* Kunth, *Paspalum pulchellum* Kunth, *Sorghastrum stipoides* (Kunth) Nash, and *Tricholaena repens* (Willd.) Hitchc.

RESUMEN

Este articulo trata sobre la presencia de nueve especies herbaces (Poaceae) de Puerto Rico que no han sido descritas previamente (Britton & Wilson 1924, Liogier & Martorell 1982): *Aristida suringari* Henrard, *Brachiaria arrecta* (Dur. & Schinz) Stent, *Imperata brasiliensis* Trin., *Microstegium vimineum* (Trin.) A. Camus, *Panicum venezuelae* Hack., *Paspalum macrophyllum* Kunth, *Paspalum pulchellum* Kunth, *Sorghastrum stipoides* (Kunth) Nash, *y Tricholaena repens* (Willd.) Hitchc.

ARISTIDA SURINGARI has been reported from St. Croix and St. Thomas and through the Netherlands Antilles (Henrard 1926, 1932, Lindeman & Stoffers 1963). The only record of *A. suringari* for Puerto Rico is a specimen collected from a limestone plateau on Mona Island, 3 March 1944 by C.E. Chardon and J.I. Otero (*Chardon and Otero 819* SJ!). This specimen, how-

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ever, was previously identified erroneously as *A. adscensionis* L. (Woodbury et al. 1977:13). Correct identification was made by comparing the specimen with type material of *A. suringari* and with material from all species of the genus native to Puerto Rico and the Virgin Islands (i.e., *A. adscensionis*, *A. chaseae* Hitchcock, *A. cognata* Trin. et Rupr., *A. portoricensis* Pilger, *A. refracta* Griseb., and *A. spiciformis* Elliott).

BRACHIARIA ARRECTA is indigenous to tropical Africa (Wells et al. 1986). It has been cultivated under the name of "Tanner grass", and although it has been reported to have been introduced into the West Indies (letter, J. Blewett, Royal Botanical Gardens, KEW, Richmond Surrey, Great Britian, 11 October 1988), we can find no reference of its introduction into the New World. On 27 September 1987, McKenzie and Proctor collected this species along a small tributary of Rio Saliente of the Torro Negro Range in central Puerto Rico (Municipio: Jayuya; Barrio: Saliente; elev. ca. 900 m; *McKenzie 747* KEW, LSU, MO, SJ, US). The habitat is similar to the "... terrestrial, moist, streambank moisture regime", listed for the species in southern Africa (Wells et al. 1986). It has been cultivated for cover and as a soil binder, but it has apparently become a problematic weed in the Republic of South Africa and Botswana (Wells et al. 1986).

The range of IMPERATA BRASILIENSIS extends from Louisiana to Florida, the Bahamas, West Indies, southern Mexico, Guatemala, Costa Rica to Brazil (Hitchcock 1909, 1913, 1927, 1930, 1936, Chase 1951, Acosta-Solis 1969, Adams 1972, Correll and Correll 1982). This species was collected by McKenzie in the Maricao State Forest in western Puerto Rico on 23 April 1987 (Municipio: Maricao; Barrio: Maricao Afuera; *McKenzie 601* FLAS, LSU, MO, SJ, US). The grass was growing in lanes cut for Caribbean Pine (*Pinus caribaea* Morelet) seedlings, on exposed banks of a recently cleared ash (*Fraxinus* sp.) plantation. This habitat is similar to the "open rather dry ground" reported for the species in the West Indies (Hitchcock 1936).

MICROSTEGIUM VIMINEUM has been introduced from Asia and is established in eastern and southeastern regions of the United States (Chase 1951). The species was collected by J. A. Edmisten on 24 October 1966 on the El Verde Experiment Station, ca. 16 km south of Rio Grande, in northeastern Puerto Rico. Because the specimen was lacking an inflorescence, Edmisten apparently forwarded the plant to W. H. Duncan, who cultivated it until the grass flowered and fruited. A specimen was then sent by Duncan to T. R. Soderstrom at the U.S. National Herbarium who identified the grass (*Duncan s.n.* LSU!).

PANICUM VENEZUELAE has previously been reported from Cuba, Dominican Republic, Guatemala, Venezuela and Brazil (Hitchcock and

Chase 1915, Hitchcock 1936, Pittier et al. 1945, Swallen 1955). This species was discovered on 4 February 1987 by Proctor, on the east peak of Las Tetas de Cayey, in south-central Puerto Rico (Municipio: Salinas; Barrio: Lapa; at elev. 820-830 m; *Proctor 42997* IJ, SJ, US). The grass was growing on stony slopes and exposed rock crevices, a habitat identical to that reported for other localities (Hitchcock and Chase 1915, Hitchcock 1936, Swallen 1955).

PASPALUM MACROPHYLLUM is known from the Andean mountains of Colombia, Ecuador, and Venezuela, where it occurs in "marshy savannas, wood borders, edges of clearings, and moist shady places," at elevations between 1200 and 1950 meters (Hitchcock 1927, Pittier et al. 1945, Acosta-Solis 1969). On 20 June 1987, McKenzie collected this species at the border of moist woods ajacent to the Maricao River and along the entrance road to the Viverous Fish Hatchery at Maricao (Muncipio: Maricao; Barrio: Maricao Afuera; *McKenzie 670* LSU). It was subsequently collected at the same location on 5 July 1987 (*McKenzie and Proctor 681* FLAS, LSU, MO, TAES, SJ, US). A third collection was made on 6 November 1987 on the campus of the University of Puerto Rico at Mayaguez (Municipio: Mayaguez; Barrio: Rio Hondo; *McKenzie 812* LSU.).

Positive identification of this species was made by comparing the above mentioned collections with type material (US! hrbr. nr. *2855795*). Previous collections of *Paspalum macrophyllum* in Puerto Rico have been erroneously identified as *Paspalum maritimum* Trin. (see Liogier and Martorell 1982). *Paspalum macrophyllum* was imported into Mayaguez, Puerto Rico in 1940 by Dr. Ovido Garcia-Molinari of the Institute of Tropical Agriculture, University of Puerto Rico, Mayaguez. The species was collected by Garcia-Molinari in Venezuela near Monte Choroni of the Andean mountain range and was introduced for livestock forage and soil erosion control (Garcia-Molinari 1946).

Paspalum macrophyllum apparently escaped from research plots at Mayaguez and recent collections near Maricao suggest that the species is expanding its range in Puerto Rico. Its habitat along the Maricao River is apparently similar to the "wood borders and moist shady places" described by Hitchcock (1927). Interestingly, Garcia-Molinari (1946) reported that the species was ". . .well adapted to dry, poor soil on steep slopes . . .", where it offered ". . .an excellent protection against soil erosion." Because we can find no evidence that *Paspalum macrophyllum* has previously been illustrated, a complete illustration is provided in Figures 1 and 2.

The range of PASPALUM PULCHELLUM has been reported from British Honduras (now Belize), Guatemala, Costa Rica, and British Guiana (now Guyana), to Brazil, Cuba, Hispaniola, and Trinidad (Hitchcock 1909,

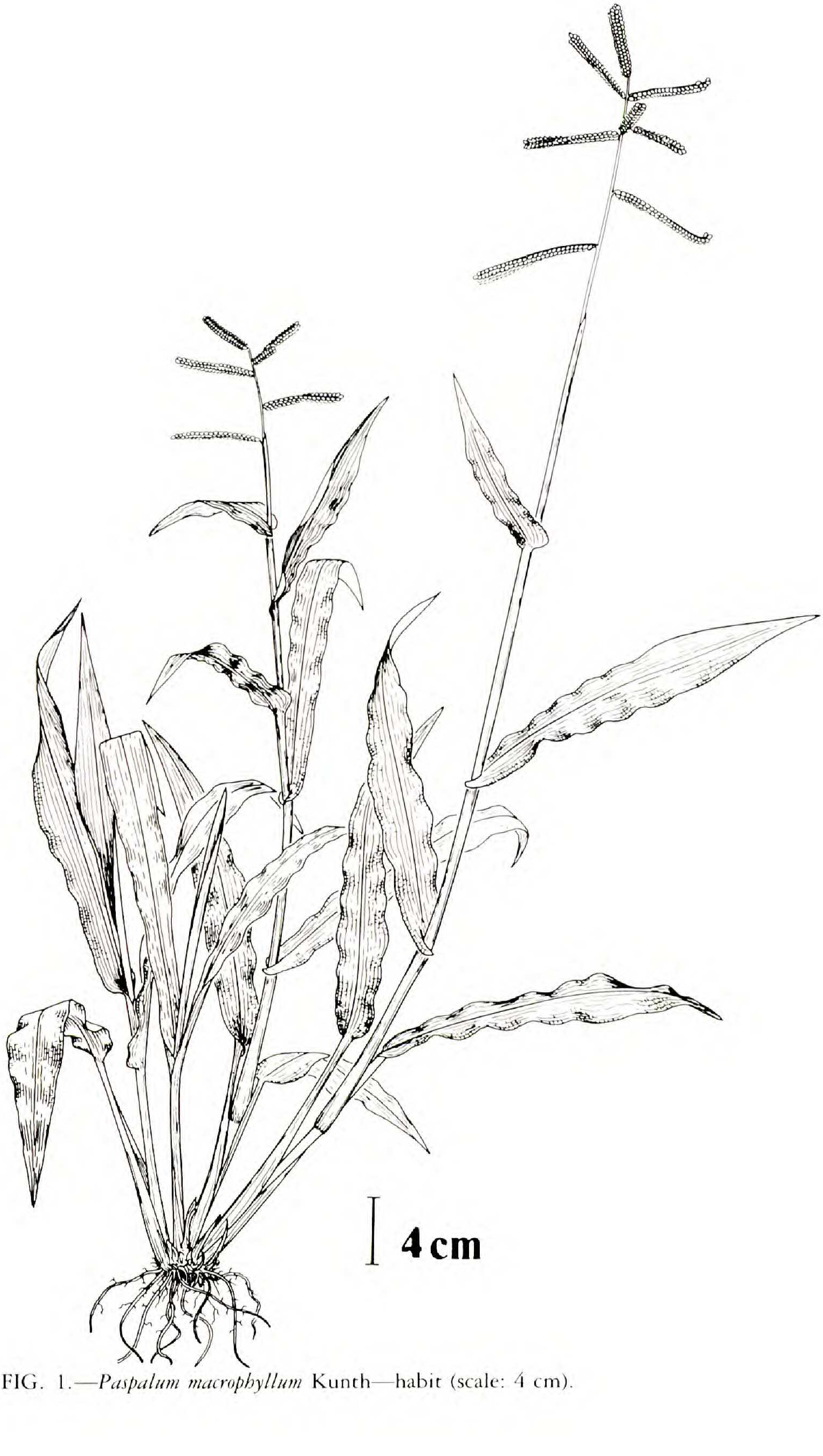

FIG. 1.—*Paspalum macrophyllum* Kunth—habit (scale: 4 cm).

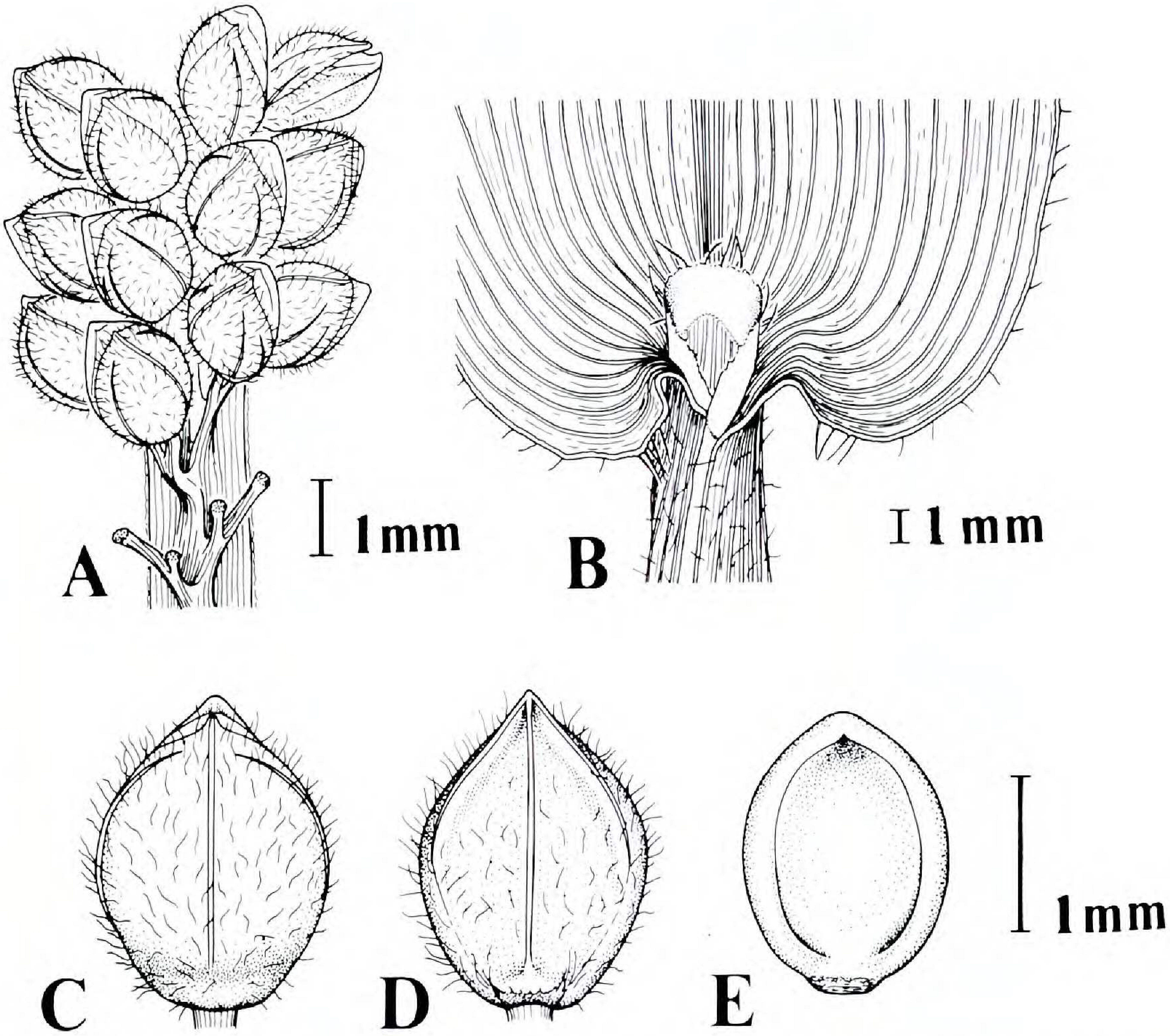

FIG. 2.—*Paspalum macrophyllum* Kunth—A: inflorescence branch; B: ligule, leaf base, and upper part of the sheath; C: spikelet with view of second glume; D: spikelet with view of sterile lemma; E: view of fertile lemma (scale for A through E: 1 mm).

1922, 1930, 1936, Chase 1929, Standley and Record 1936, Moscosco 1943, Swallen 1955, Pohl 1980). On 2 August 1987, McKenzie discovered this species growing in recently disturbed soil, on red clay slopes of Cerro Las Mesas at Mayaguez (Municipio: Mayaguez; Barrio: Juan Alonso; at elev. ca. 340 m; *McKenzie 711* FLAS, LSU, MO, TAES, SJ, US). On 7 September 1988, the species was subsequently collected at the same locality by McKenzie (*McKenzie 1011* LSU, US) and Proctor (*Proctor 44998* SJ). The habitat on Cerro Las Mesas is unlike the "sandy mostly moist savannas and pinelands" (Hitchcock 1936) reported from other localities.

SORGHASTRUM STIPOIDES is known from Cuba (Hitchcock 1936, Leon 1946) and South America (Colombia, Bolivia, and Ecuador to Argentina: Hitchcock 1927, 1936; Acosta-Solis 1969). On 24 September 1988, Proctor collected this species in dry, silica sand, near Laguna Tortugero in north central Puerto Rico (Municipio: de Vega Baja; Barrio: Algarrobo; *Proctor*

45036 IJ, LSU, SJ, US). The late discovery of this species in Puerto Rico is probably due to its close resemblance to *Sorghastrum setosum* (Griseb.) Hitchc., which has been collected near the same locality (*Chase 6421* US: see Hitchcock 1936:410). *Sorghastrum stipoides*, however, can be easily distinguished from *Sorghastrum setosum* by its longer awns (10-15 mm) that are geniculate and strongly twisted at the base. In *Sorghastrum setosum* the awns are straight and ca. 2 mm long (to ca. 5 mm long on cultivated specimens).

Tricholaena Schrader and *Rhynchelytrum* Nees ". . . are names applied to two closely related groups of panicoid grasses widely distributed in Africa and Arabia" (Fosberg 1981). Many taxonomists have considered the two genera as distinct (e.g., Hutchinson and Dalziel 1936, Phillips 1951). This decision is apparently based on the authority of C. E. Hubbard who failed to publish his evaluations (Fosberg 1981). Fosberg (1981) believed that characters used by Hubbard to separate *Tricholaena* and *Rhynchelytrum* were too weak to warrant distinct generic status. Consequently, he chose to recognize only *Tricholaena*, the older name.

TRICHOLAENA ROSEA Nees is an attractive perennial, or occasionally annual grass native to Africa. It has been introduced as an ornamental and has become a common weed in Puerto Rico and other tropical and subtropical regions of the Americas (Hitchcock 1936, Chase 1951, Lindeman and Stoffers 1963, Gooding et al. 1965, Gould 1975, Liogier and Martorell 1982). *Tricholaena repens* (Willd.) Hitchc. is apparently an annual species native to West Africa (Fosberg 1981). Although Fosberg (1981) provided information suggesting that *Tricholaena rosea* was specifically distinct from *Tricholaena repens*, the two species have often been confused. Suggestively, Chase (1951:947) agreed with the assessment of Fosberg (1981) and stated that the species introduced into the United States (*Tricholaena rosea*) had been confused with the annual species from West Africa (*Tricholaena repens*).

Woodbury et al. (1977) listed *Rhynchelytrum repens* for Mona Island and stated, "Introduced by the Insular Experiment Station at Rio Piedras in 1922, now naturalized in many areas of Puerto Rico and nearby islands including Desecheo. Native to Tropical Africa. This grass has been confused at times with its allied species *Rhynchelytrum roseum* (Nees) Stapf. and Hubbard, also native to Africa." Although Woodbury et al. (1977) acknowledged that *Tricholaena rosea* was specifically distinct from *T. repens*, they apparently confused the two and listed the wrong species for Mona Island. The *Tricholaena* on Mona Island has distinct rose or purplish spikelets and is thus *T. rosea* and not *T. repens*.

Due to such confusion and the failure of some authors to recognize that the two species are distinct (e.g., Liogier and Martorell 1982), the following names have been misapplied to *Tricholaena rosea: Rhynchelytrum roseum*

(Nees) Stapf & Hubb.: Chase (1951), Swallen (1955); *Rhynchelytrum repens* (Willd.) C.E. Hubb.: Gooding et al. (1965), Acosta-Solis (1969), Gould (1975); and *Tricholaena repens*: Hitchcock (1936), Moscosco (1943), Garcia-Molinari (1952), Lindeman and Stoffers (1963).

Proctor discovered TRICHOLAENA REPENS growing in white sand at Laguna Tortugero, northwestern Puerto Rico (Municipio: Manati, Barrio: Tierras Nuevas Saliente) on 28 November 1986 (*Proctor 42684* SJ, US). The species was subsequently collected at the same locality by McKenzie on 23 July 1987 (*McKenzie 700*, FLAS, LSU, US). Additional voucher specimens from Laguna Tortugero include: (*Proctor 44037*, HAJB, IJ, NY, SJ, US). On a recent collecting trip to Cuba, Proctor noted that *Tricholaena repens* also inhabits white sand there.

At Laguna Tortugero, *Tricholaena rosea* and *Tricholaena repens* occur sympatrically and are usually easily separated. Young and median-aged specimens of *Tricholaena rosea* can be distinguished from *Tricholaena repens* by their rosy red to purplish and larger spikelets (measured from the base of the spikelet to the tip of the awn of the sterile lemma: 3.5-5.0 mm, vs. 2.5-3.2 mm, respectively), their habit of often having nodding panicles, and their lack of conspicuous, purplish, aerial roots on the lower nodes. *Tricholaena repens* is characterized by its smaller, paler spikelets, its more erect panicles, and the presence of conspicuous, purplish, aerial roots on the lower nodes. Because old, faded spikelets of *Tricholaena rosea* are often pale (Fosberg 1981), identification between mature specimens of the two species can be difficult. Thus, for such specimens, spikelet size, panicle shape, and presence or absence of purplish aerial roots on the lower nodes should be the major criteria used for correct identification. Under magnification, *Tricholaena rosea* can be further distinguished from *Tricholaena repens* thusly: in *Tricholaena repens*, hairs on the spikelets are uniformly spreading and the hair bases of the second glume and lemma of the lower floret are conspicuously tuberculate, whereas in *Tricholaena rosea*, hairs on the spikelets are not uniformly spreading but oriented toward the apex, and the hair bases of the second glume and lemma of the lower floret are not conspicuously tuberculate.

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